



THE
ONTARIO WATER RESOURCES
COMMISSION

WATER POLLUTION SURVEY

of the

SEPARATED TOWN OF SMITH'S FALLS

in the

COUNTY OF LANARK

1968

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ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET

TORONTO 5

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275 Ontario Street,
Kingston, Ontario,
March 25, 1968.

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GENERAL MANAGER
W. S. MACDONNELL
COMMISSION SECRETARY

Mr. F. R. Gilroy,
Clerk,
Separated Town of Smith's Falls,
Town Hall,
SMITH'S FALLS, Ontario.

Dear Mr. Gilroy:

Re: Separated Town of Smith's Falls
Water Pollution Survey

We are pleased to provide council with a water pollution survey report which was prepared subsequent to investigations conducted by OWRC field staff during the summer of 1967.

The report deals with water use and waste disposal at Smith's Falls, in addition to assessing pollution of the Rideau River. The survey generally concludes that degradation of water quality occurs at Smith's Falls. The abundant aquatic growth downstream from this municipality results from nutrient build-up in the watercourse. Inadequately treated sewage discharges from the municipal sewage system are the main contributors to the adverse sanitary and aesthetic quality of the Rideau River. Two lesser sources of pollution of the river at Smith's Falls are the discharge from a sanitary land-fill winter site and the sewage discharge from a commercial establishment.

The survey report presents four recommendations to council which are considered important to the control of pollution of the Rideau River at the Separated Town of Smith's Falls. We solicit your co-operation in this matter and we invite any comments you may have on this report.

Yours very truly,

A handwritten signature in cursive script, reading "L. G. South".

WCS/jn
Encl.

L. G. South, P. Eng.,
District Engineer,
Division of Sanitary Engineering.

DISTRIBUTION LIST

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Separated Town of Smith's Falls,
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THE
ONTARIO WATER RESOURCES
COMMISSION
Report on a
WATER POLLUTION SURVEY
of the
SEPARATED TOWN OF SMITH'S FALLS *
in the
COUNTY OF LANARK
DISTRICT ENGINEERS BRANCH
DIVISION OF SANITARY ENGINEERING
1968

* It should be recognized that the name of the town is now spelled SMITHS FALLS; however, as the report was prepared in part prior to this change, the old form has been used throughout.

WATER POLLUTION SURVEY
of the
SEPARATED TOWN OF SMITH'S FALLS

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WATER POLLUTION SURVEY
of the
SEPARATED TOWN OF SMITH'S FALLS

INTRODUCTION

A water pollution survey was performed in the Separated Town of Smith's Falls during the summer of 1967. Surveys of this nature are made by the Ontario Water Resources Commission for the purpose of locating and recording sources of existing and potential water pollution. This survey was prompted as a result of considerable local concern about the water quality of the Rideau River, and to assess the receiving stream characteristics prior to the proposed upgrading of the Smith's Falls Municipal Sewage Works.

The assistance provided by the following municipal officials during the course of this survey is gratefully acknowledged:

Mr. F.R. Gilroy, Clerk,
Separated Town of Smith's Falls;

Mr. M.H. Lloyd, P.Eng., Town Engineer,
Separated Town of Smith's Falls;

Mrs. A.M. Neill, Secretary-Treasurer,
The Chamber of Commerce,
Separated Town of Smith's Falls;

Mr. B.H. Young, Chief Public Health Inspector,
Leeds, Grenville and Lanark Health Unit;

Mr. W.G. Armstrong, Public Health Inspector,
Leeds, Grenville and Lanark Health Unit.

SEPARATED TOWN OF SMITH'S FALLS

The Separated Town of Smith's Falls, with a population of some 9,955 persons is located on the Rideau River, in the County of Lanark at the intersection of Highways 29 and 43. Smith's Falls was incorporated as a village in 1854 and as a town in 1882. Smith's Falls was the first

town in Ontario to have a government approved plan for the development and expansion of its boundaries. The town by virtue of an Official Plan is divided into four district wards: residential, commercial, light manufacturing and heavy-industry areas.

The Rideau River, which has its headwaters in the Rideau Lakes System, passes through Smith's Falls and eventually discharges to the Ottawa River, at the City of Ottawa. Two sets of lift locks and associated water level control dams are located on the Rideau Canal System at Smith's Falls. All drainage from the town is to the Rideau River. The locations of pertinent outfalls to the river are shown on the appended map.

WATER USES

Municipal

The municipal water purification plant is centrally located on the north side of the Rideau River at Maple Street. The river is the source of supply, the intake being located some 1200 feet upstream. Treatment procedures include coagulation, filtration, chlorination and fluoridation. Storage is provided in a 225,000 gallon elevated tank.

The water pumpage data for 1964, 1965 and 1966 is recorded as follows:

1964

Total Pumpage	729,398,000	gallons
Average Daily Pumpage	1,993,000	"
Maximum Daily Pumpage (July)	4,088,000	"
Minimum Daily Pumpage (Oct.)	1,111,000	"
Average Daily Per Capita Consumption	177	"
Percent Decrease in Total Pumpage from 1963		5.22

1965

Total Pumpage	695,624,000	gallons
Average Daily Pumpage	1,905,000	"
Maximum Daily Pumpage (July)	3,790,000	"
Minimum Daily Pumpage (Sept.)	1,082,000	"
Average Daily Per Capita Consumption	166	"
Percent Decrease in Total Pumpage from 1964		4.63

1966

Total Pumpage	678,729,000	gallons
Average Daily Pumpage	1,855,000	"
Maximum Daily Pumpage (June & July)	3,845,000	"
Minimum Daily Pumpage (Jan.)	1,200,000	"
Average Daily Per Capita Consumption	151	"
Percent Decrease in Total Pumpage from 1965		2.49

The decrease in Total Pumpage for the period is attributed to the leak detection and elimination programme on the water distribution system.

Industrial

There are some 12 industries in Smith's Falls employing approximately 2,240 persons. The water requirements for these industries are provided by the municipal water works. A list of the industries together with their products is appended.

Recreational

The Rideau River is popular for swimming, boating and fishing in the Smith's Falls area. Dock facilities are provided for boating traffic at a municipal tourist park, and a supervised swimming beach and recreational area are available.

WASTE DISPOSAL

Municipal Sewage Works

The Smith's Falls sewage works includes a primary treatment plant located on the north side of the Rideau River, approximately 700 feet east of the corporation limits. Treatment afforded includes screening, grit removal, clarification, sludge digestion and effluent chlorination. Sewage from the south side of the Rideau River is directed to a pumping station located at Broadview Avenue East from which it is pumped across the river to the main collector sewer along Queen Street. This plant also receives the sewage flows from the Ontario Hospital just east of Smith's Falls. The sewer system serving the town, is, for the most part, a combined sewer system. New sewer installations are separate sewers; however, the old combined sewer system conducts the majority of storm water and sanitary sewage. Some 9 overflows

are located on the collector system, including one at the sewage treatment plant, which permit the bypassing of raw sewage to the Rideau River during periods of high precipitation and when the hydraulic design of the sewage treatment plant of 2.0 million gallons per day (MGD), is exceeded. It should be noted that sewage has been observed to bypass at the plant for a period up to one week after the occurrence of heavy rain.

A summary of flow figures at the plant for 1964, 1965 and from January 1, 1966 to July 31, 1967 are included as follows:

1964

Total raw sewage flow	860.48 million gallons
Average daily flow	2.35 " "
Maximum daily flow (April)	3.70 " "
Minimum daily flow (Aug-Sept.)	1.41 " "
Maximum instantaneous flow	4.7 " " per day

1965

Total raw sewage flow	769.2 million gallons
Average daily flow	2.21 " "
Maximum daily flow (Oct.)	3.60 " "
Minimum daily flow (Oct.)	1.10 " "
Percentage decrease over 1964	10.6

1966 to July 31, 1967

Total raw sewage flow	1059.2 million gallons
Average daily flow	1.95 " "
Maximum daily flow (Feb.)	3.59 " "

Minimum daily flow (Jan.)	1.04 million gallons
Average per capita flow	197 gallons per day
Percentage decrease in average daily flow over 1964	17.0

While untreated sewage is still frequently bypassed to the Rideau River, it is encouraging that the average daily flow to the plant has been decreased to a level within the design capacity of the sewage treatment plant. This decrease in the daily flow may be attributed in part to the programme of separating storm and sanitary sewers.

The consulting firm of J.D. Lee and Company Limited, have been contracted by the municipality to study the methods of upgrading the sewage works.

Private Waste Disposal

No municipal sanitary sewers are available at an office and apartment building located on the west side of Beckwith Street between the canal and the river. The sanitary wastes from this building were reportedly directed to the Rideau River.

No other problematical private waste disposal systems were encountered during this survey.

Refuse Disposal

Two municipal refuse disposal sites are operated by Smith's Falls. The main sanitary landfill site is located on the south side of the Rideau River west of Carthage Street. While this site is not ideally located from a water pollution control point of view, care in its operation has prevented it becoming a serious source of water contamination.

A second sanitary landfill site utilized during the winter months since 1960, and located between the Rideau River and the Old Sly Locks on the east side of Carthage Street, has been less successful. Failure to properly implement several recommendations included in an OWRC site inspection report, dated October 20, 1960, has resulted in drainage problems at this disposal site. Water continues to gain access to the disposal area. Contaminated leachate from the decomposing refuse discharges to the Rideau River at the south-east corner of the site. Efforts by the municipality to correct this problem have only provided temporary results. Proposed sealing of leaks in the canal in this area may resolve the problem.

SAMPLING PROCEDURES

The locations of sampling points are shown on the appended map of the Separated Town of Smith's Falls. Samples were collected from all outfalls where significant flows were observed. Stream samples were collected at pertinent points in order to assess the influence of waste flows on the receiving stream. The cooperation provided by the Leeds, Grenville and Lanark Health Unit staff in collecting stream samples is appreciated.

The majority of laboratory analyses were performed at the Ontario Water Resources Commission Laboratories in Toronto. A number of bacteriological examinations were made at the Regional Department of Health Laboratories. The significance of these tests is included in the appendix to this report as are the tabulated laboratory results of samples collected on various occasions.

SAMPLE RESULTS AND OBSERVATIONSMunicipal Sewer System

At the time of the outfall survey on June 13, 1967, water levels in this area of the river were being maintained at a high level to facilitate boating traffic in the Rideau Canal. Consequently many outfall sewers were submerged and could not be accurately located. In instances such as this the nearest manholes and/or catch-basins were inspected to determine if discharges to the Rideau River were occurring at bypasses.

With the exception of the sewage treatment plant, eight outfall sewers and seven combined sewer bypasses were located. Contaminated flows were discharging from three of these outfalls at sampling points R.60.94 W-B, R.61.00 W, and R.61.04 W. No pertinent over-flows were occurring at the bypasses located on June 13, 1967. Excessive coliform organisms, BOD, and suspended solids concentrations indicate the presence of sanitary wastes in the discharges from outfalls, while high phenols counts indicate that industrial wastes are present. Nitrogen determinations help to determine the rate of decomposition of organic wastes. Sewage wastes were observed discharging from the storm sewer outfall on the east side of Beckwith Street (R.61.00 W).

The effluent from the municipal sewage treatment plant discharges to the Rideau River from an outfall located at the north shore near the water level. The high coliform counts in a number of effluent samples indicate that chlorination practices at the plant need closer attention. The bypass sewer at the sewage treatment plant is directed to the above-noted outfall. As a result when raw sewage is bypassed an unpleasant aesthetic condition is created around the outfall structure and downstream. The occurrence of this condition has been

noted by boating traffic in this area of the Rideau Canal and by property owners downstream from the sewage works. The sewage treatment plant records for the month of June, 1967, indicated that flows to the plant exceeded the plant capacity on 22 days out of 30.

Open Drainage Courses

At least three open drainage courses are directed to the Rideau River from Smith's Falls. The flow in the creek east of Brockville Street was of satisfactory quality; however, a discharge from the municipal sanitary landfill (winter site) showed gross contamination in several samples. High BOD, suspended solids, nitrogen and iron determinations were indicators of the quality of the discharge.

Rideau River

Samples were collected from the Rideau River at 12 locations, nine upstream and three downstream from the sewage treatment plant.

The Rideau River at the upstream side of Smith's Falls at sampling points R.61.40 (C.N.R. Bridge) and R.61.30 (Abbott Street Bridge) was generally within the stream quality objectives for bacterial coliform content and BOD. Samples between Abbott Street and the Confederation Drive Bridge showed little change in water quality. A municipal swimming area in this part of the river has been satisfactory. There are no bypass sewers to the Rideau River in this area. Nitrogen determinations in this area of the river indicated high free ammonia and total Kjeldahl levels. Stream nitrogen determinations permit a measure of nutrient build-up.

The next section of the river considered is between Beckwith Street, and Carthage Street and the Old Sly Locks. The coliform bacteria content and BOD of the river show increases in this section. The majority of storm and combined sewer outfalls are directed to

the Rideau River in this area. The main sanitary landfill site borders the south side of the river in this area. The Rideau River broadens in the above section and considerable aquatic plant growth is experienced during the summer months.

The final section of the Rideau River to be considered in this survey is the area downstream from the Smith's Falls municipal sewage treatment plant. Substantial increases in coliform bacteria content, iron concentrations, and BOD are noted, frequently to levels in excess of the objectives for surface waters in Ontario. A further increase in nitrogen levels occur, with excessively high free ammonia and total Kjeldahl levels. Water quality monitoring data has indicated nutrient enrichment to a level which would promote nuisance aquatic growth in this section of the river. A 1966, OWRC Preliminary Wastewater Assimilation Study, confirmed excessive aquatic growth downstream from Smith's Falls. The results of samples of the sewage treatment plant discharge reveal that it is the main source of degradation of water quality in this area of the river. A discharge from the winter sanitary landfill site was also contributing to stream pollution. Aquatic plant growth in this area of the river becomes very notable, and bays and shorelines are frequently weed-choked.

SUMMARY AND CONCLUSIONS

A water pollution survey of the Separated Town of Smith's Falls was conducted during the summer of 1967. Investigations were made to assess the quality of the Rideau River in the Smith's Falls area. The laboratory results of samples collected by various agencies over a period of time are included in the report.

The survey generally revealed that degradation in stream quality occurs as the Rideau River flows through Smith's Falls. The degree of pollution appears to be highest downstream from the municipal sewage treatment plant where the sanitary, biological and aesthetic qualities become impaired.

The municipal sewage treatment plant effluent is the main source of stream degradation. While the operating efficiency of the sewage works has generally been favourable for a primary treatment plant, a combination of hydraulic overloading of the plant and poor location of the outfall sewer are major factors in the sanitary and aesthetic degradation of the river. Sample results have indicated that chlorination practices require improvement. The nutrient enrichment and consequent aquatic growth in the river below Smith's Falls is for the most part a result of organic loading from the primary sewage treatment plant and overflows. If the aesthetic qualities of the Rideau River continue to deteriorate, then a higher than primary degree of treatment may eventually become necessary to reduce nutrient enrichment of this watercourse. Depending on the volume of flow, sewage can flow to the Rideau River from some nine bypasses on the combined sewer system. The consulting firm of J.D. Lee Company Ltd. is studying methods of reducing untreated sewage discharges to the Rideau River.

In addition to pollution from the municipal sewage system, drainage from the municipal sanitary landfill winter site and the sewage wastes from a previously noted commercial establishment on the west side of Beckwith Street also contribute to the contamination of the Rideau River.

RECOMMENDATIONS

- 1) The separated Town of Smith's Falls should ensure early implementation of their consulting engineers' pending report. Improvements should include better chlorination treatment, extension of the plant outfall sewer and the elimination of untreated sewage discharges to the Rideau River.
- 2) The programme of separating storm and sanitary sewers in Smith's Falls should be continued.
- 3) Drainage to the Rideau River from the municipal sanitary landfill winter site should be eliminated.
- 4) An approved method of sewage disposal should be provided at the commercial building on the west side of Beckwith Street between the Rideau Canal and the river.

WCS/jn

Report Prepared By: W. C. Stevens
W.C. Stevens, Technician.

APPENDIX

INDUSTRIES

<u>Name</u>	<u>Product</u>
Beach Industries Ltd.	Sheet Metalware
Cairns Garments Ltd.	Nightwear
Canadian Pacific Railway	Public Service
J.H. Darcy Ltd.	Electronics
Guidline Instruments Ltd.	Electrical Instruments and Standards
Hershey Chocolate of Canada Ltd.	Chocolate Products
Lanark Mills Ltd.	Automatic Electric Blankets
Macintyre Wood Mfg. Ltd.	Shipping Containers
Mason Boats Ltd.	Boats
Royalite Metal Furniture Co. Ltd.	Steel Office Equipment and Hospital Furniture
R.C.A. Victor Co. Ltd.	Records
Wire Rope Industries of Canada	Wire Ropes

TOWN OF SMITH'S FALLS

WATER POLLUTION SURVEY

* SAMPLED BY LEEDS & GRENVILLE HEALTH UNIT

**SAMPLED BY SMITH'S FALLS PUBLIC UTILITIES COMMISSION

SAMPLE POINT NO.	DESCRIPTION	DATE	COLIFORM	5-DAY	S O L I D S			N I T R O G E N		AS	N	ANIONIC		PHENOLS	IRON
			BACTERIA PER 100 ML		BOD	TOTAL	SUSP	DISS	FREE AMMONIA	TOTAL KJELDAHL	NITRITE	NITRATE	AS ABS	IN PPB	AS FE
R-61.21	RIDEAU RIVER AT MUNICIPAL SWIMMING AREA	JULY 26/60	70	3.0	---	---	---	---	---	---	---	---	---	---	---
		JULY 26/60	80	2.6	---	---	---	---	---	---	---	---	---	---	---
		JUNE 13/67	92	1.4	140	4	136	0.16	1.30	0.00	0.20	0.0	---	---	---
R-61.28	RIDEAU RIVER - EAST OF ABBOTT STREET (MUNICIPAL WATER WORKS INTAKE CONDUIT)	JULY 26/60	50	3.2	---	---	---	---	---	---	---	---	---	---	---
	** JAN. 17/66	39 FC	---	---	---	---	---	---	---	---	---	---	---	---	---
	** FEB. 28/66	39 FC	---	---	---	---	---	---	---	---	---	---	---	---	---
	** MAR. 21/66	15 FC	---	---	---	---	---	---	---	---	---	---	---	---	---
	** APR. 11/66	39+ FC	---	---	---	---	---	---	---	---	---	---	---	---	---
	** MAY 2/ 66	39 FC	---	---	---	---	---	---	---	---	---	---	---	---	---
	** JUNE 6/66	39 FC	---	---	---	---	---	---	---	---	---	---	---	---	---
	** JULY 4/66	8.9 FC	---	---	---	---	---	---	---	---	---	---	---	---	---
	** JULY 16/66	43 TC	---	---	---	---	---	---	---	---	---	---	---	---	---
		23 FC	---	---	---	---	---	---	---	---	---	---	---	---	---
	** AUG. 2/66	39+ TC	---	---	---	---	---	---	---	---	---	---	---	---	---
		0 FC	---	---	---	---	---	---	---	---	---	---	---	---	---
	** FEB. 20/67	39+ FC	---	---	---	---	---	---	---	---	---	---	---	---	---
	** MAR. 13/67	39+ TC	---	---	---	---	---	---	---	---	---	---	---	---	---
		39+ FC	---	---	---	---	---	---	---	---	---	---	---	---	---
	** APR. 3/67	2400 TC	---	---	---	---	---	---	---	---	---	---	---	---	---
		230 FC	---	---	---	---	---	---	---	---	---	---	---	---	---
	** MAY 1/67	23 TC	---	---	---	---	---	---	---	---	---	---	---	---	---
		0 FC	---	---	---	---	---	---	---	---	---	---	---	---	---
R-61.29	ABBOTT STREET - STORM SEWER OUTFALL TO RIDEAU RIVER CANAL	JUNE 13/67	INSUFFICIENT FLOW FOR SAMPLING. OUTFALL NOT LOCATED.												

UNLESS OTHERWISE INDICATED ALL RESULTS RECORDED IN PPM.

TOWN OF SMITH'S FALLS

WATER POLLUTION SURVEY

* SAMPLED BY LEEDS & GRENVILLE HEALTH UNIT

**SAMPLED BY SMITH'S FALLS PUBLIC UTILITIES COMMISSION

SAMPLE POINT NO.	DESCRIPTION	DATE	COLIFORM	5-DAY	S O L I D S			N I T R O G E N		AS	ANIONIC		PHENOLS	IRON
			BACTERIA PER 100 ML		BOD	TOTAL	SUSP	DISS	FREE AMMONIA	TOTAL KJELDAHL	NITRITE	NITRATE	AS ABS	IN PPB
R-60,30 T	SMITH'S FALLS MUNICIPAL SEWAGE TREATMENT PLANT- EFFLUENT	JAN. 19/66	---	38	---	72	---	---	---	---	---	---	---	---
		FEB. 17/66	---	18	---	34	---	---	---	---	---	---	---	---
		MAY 4/66	---	10	---	15	---	---	---	---	---	---	---	---
		OCT. 20/66	---	78	---	78	---	---	---	---	---	---	---	---
		DEC. 14/66	---	72	---	50	---	---	---	---	---	---	---	---
		APR. 13/67	---	52	---	62	---	---	---	---	---	---	---	---
		*MAY 4/67	240,000+ TC 11,000 FC	12	234	44	190	---	13.0	---	---	---	---	---
		*MAY 19/67	---	42	582	64	518	---	---	---	---	---	---	---
		*MAY 29/67	240,000+ TC 240,000+ FC	56	434	79	355	12.6	19.8	0.00	0.05	---	---	---
		JUNE 13/67	93,000,000	165	548	60	488	13.9	22.0	0.00	0.05	1.1	30	---
		JUNE 14/67	410,000,000	104	400	164	236	5.25	22.0	0.00	0.07	1.6	---	---
		JULY 5/67	12,600,000	53	480	58	422	9.02	58.0	0.00	0.08	1.7	---	---
		AUG. 15/67	183,000,000	122	426	82	344	3.94	12.0	0.02	0.05	3.5	---	---
R-60,40	RIDEAU RIVER AT OLD SLY LOCKS--UPSTREAM FROM MUNICIPAL S.T.P.	NOV. 3/61	14	2.2	138	2.3	---	---	---	---	---	---	---	---
		OCT. 26/66	110	1.6	156	<15	---	0.20	0.46	0.00	0.00	---	---	1.13
		DEC. 5/66	224	1.5	116	<15	---	0.11	0.58	0.00	0.05	---	2	0.18
		APR. 17/67	49,000	3.8	---	270	---	0.08	2.30	0.00	0.25	---	---	0.37
		MAY 8/ 67	750	2.7	158	<15	---	0.12	0.98	0.00	0.01	---	2	0.10
		JUNE 5/67	---	0.7	---	---	---	---	---	---	---	---	---	---
		JULY 4/67	60,000	2.2	104	4	---	0.23	1.10	0.01	0.06	---	---	---
		JULY 31/67	3,500	0.7	132	6	---	0.23	1.15	0.00	0.05	---	---	0.23
		SEPT. 5/67	---	1.8	144	2	---	0.06	---	---	0.00	---	---	0.15

UNLESS OTHERWISE INDICATED ALL RESULTS ARE RECORDED IN PPM,

TOWN OF SMITH'S FALLS

WATER POLLUTION SURVEY

* SAMPLED BY LEEDS & GRENVILLE HEALTH UNIT

** SAMPLED BY SMITH'S FALLS PUBLIC UTILITIES COMMISSION

SAMPLE POINT NO.	DESCRIPTION	DATE	COLIFORM BACTERIA PER 100 ML	5-DAY BOD	S O L I D S			N I T R O G E N A S N				ANIONIC DETERGENTS AS ABS	PHENOLS IN PPB	IRON AS FE
					TOTAL	SUSP	DISS	FREE AMMONIA	TOTAL KJELDAHL	NITRITE	NITRATE			
R-61.30	RIDEAU RIVER AT ABBOTT STREET BRIDGE	NOV. 3/61	42	2.4	136	2.1	---	---	---	---	---	---	---	---
		*APR. 14/67	9.1 TC 0 FC	1.8	---	5	---	0.16	1.10	0.00	0.15	---	---	---
		*APR. 20/67	110,000 TC 4,600 FC	1.5	176	2	174	---	0.98	---	---	---	---	---
		APR. 27/67	7.3 TC 0 FC	1.2	142	2	140	---	0.91	---	---	---	---	---
		*MAY 4/67	5 TC 0 FC											

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UNLESS OTHERWISE INDICATED ALL RESULTS RECORDED IN PPM.

TOWN OF SMITH'S FALLS

WATER POLLUTION SURVEY

* SAMPLED BY LEEDS & GRENVILLE HEALTH UNIT

**SAMPLED BY SMITH'S FALLS PUBLIC UTILITIES COMMISSION

SAMPLE POINT NO.	DESCRIPTION	DATE	COLIFORM BACTERIA PER 100 ML	5-DAY BOD	S O L I D S			N I T R O G E N		A S	N	ANIONIC		PHENOLS	IRON
					TOTAL	SUSP	DISS	FREE AMMONIA	TOTAL KJELDAHL			DETERGENTS NITRITE	NITRATE		
R-61.30	RIDEAU RIVER AT ABBOTT STREET BRIDGE	*MAY 4/67	5 TC	----	---	---	---	----	----	---	---	---	---	---	---
			0 FC	2.4	1146	2	1144	----	1.4	---	---	---	---	---	
		*MAY 19/67	3.6 TC												
			0 FC	1.3	212	5	207	----	---	---	---	---	---	---	
		* MAY 29/67	----	2.8	222	71	151	0.20	0.58	0.01	0.07	---	---	---	
		JUNE 14/67	52	1.0	80	7	73	0.30	0.65	0.00	0.05	---	---	---	
		JULY 5/67	600	1.6	150	3	147	0.16	0.71	0.03	0.04	0.0	---	---	
	AUG. 15/67	108	0.7	72	7	65	0.13	0.64	0.00	0.00	0.02	---	---		
R-61.40	RIDEAU RIVER AT C.N. RWY. BRIDGE														
		1) NORTH BRIDGE													
		JULY 26/60	140	6.4	---	---	---	----	----	---	---	---	---	---	---
		JUNE 13/67	48	1.5	166	3	163	0.23	0.98	0.00	0.08	0.0	---	---	
		2) SOUTH BRIDGE													
		JULY 26/60	140	3.2	---	---	---	----	----	----	---	---	---	---	
	JUNE 13/67	8	1.3	142	1	141	0.30	0.91	0.00	0.12	0.0	---	---		
R-62.04	HANNIBAL STREET- W STORM SEWER OUTFALL	JUNE 13/67	N O	F L O W											
R-62.48	ELMSLEY STREET - STORM D SEWER OUTFALL TO DITCH NORTH OF TOWN	JUNE 13/67	N O	F L O W											

UNLESS OTHERWISE INDICATED ALL RESULTS ARE RECORDED IN PPM.

SEPARATED TOWN OF SMITH'S FALLS

WATER POLLUTION

SURVEY

*SAMPLED BY LEEDS & GRENVILLE HEALTH UNIT

**SAMPLED BY SMITH'S FALLS PUBLIC
UTILITIES COMMISSION

SAMPLE POINT NO.	DESCRIPTION	DATE	COLIFORM BACTERIA PER 100 ML	5-DAY BOD	S O L I D S			N I T R O G E N A S N				ANIONIC DETERGENTS		PHENOLS IN PPB	IRON AS FE
					TOTAL	SUSP	DISS	FREE AMMONIA	TOTAL KJELDAHL	NITRITE	NITRATE	AS ABS			
R-54.70	RIDEAU RIVER - DOWNSTREAM FROM SMITH'S FALLS SEWAGE TREATMENT PLANT	*APRIL 14/67	11,000 TC												
			23 FC	2.4	---	3	---	0.21	1.40	0.01	0.20	--	--	--	
		*APRIL 20/67	24,000 TC												
			4,600 FC	2.3	184	2	182	---	0.98	---	---	--	--	--	
		*APRIL 27/67	4,600 TC												
			240 FC	0.6	166	4	162	---	1.10	---	---	--	--	--	
	*MAY 4/67	15,000	3.2	152	4	148	---	1.50	---	---	--	--	--		
	*MAY 29/67		4.0	134	7	127	0.99	2.1	0.01	0.07	--	--	--		
R-59.70	RIDEAU RIVER - 0.5 MILES EAST OF SMITH'S FALLS (DOWNSTREAM FROM STP)	JUNE 15/67	14,700	1.1	130	2	128	0.39	---	0.00	0.60	0.1	--	--	
		JUNE 14/67	308	---	148	14	834	0.39	0.91	0.00	0.08	--	--	--	
		JULY 5/67	2,900	1.4	150	4	146	0.26	0.52	0.18	0.03	0.0	--	--	
		JULY 15/67	8,400	1.0	112	5	107	0.20	0.91	0.00	0.04	0.02	--	--	
R-60.20	RIDEAU RIVER AT HIGHWAY NO. 43 - 0.3 MILES EAST OF SMITH'S FALLS (DOWNSTREAM FROM STP)	OCT. 26/67	160,000	3.7	112	<15	---	1.18	2.10	0.01	0.01	---	--	7.7	
		DEC. 5/67	31,000	6.2	268	100	---	0.53	1.80	0.00	0.05	--	8	7.5	
		APR. 17/67	110	2.5	180	4	---	0.16	0.65	0.00	0.20	--	--	8.2	
		MAY 8/67	740,000	1.6	238	13	---	0.43	1.65	0.00	0.05	--	12	7.5	
		JUNE 5/67	-----	3.5	176	35	---	---	---	---	---	--	--	--	
		JULY 4/67	100,000	2.5	---	9	---	0.23	1.65	0.01	0.04	--	--	--	
		JULY 31/67	1,900,000	0.4	166	13	---	0.53	1.82	0.00	0.06	--	--	7.8	
		SEPT. 5/67	-----	7.0	172	4	---	0.66	3.50	0.058	0.05	--	--	--	

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SEPARATED TOWN OF SMITH'S FALLS

WATER POLLUTION

SURVEY

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UTILITIES COMMISSION

SAMPLE POINT NO.	DESCRIPTION	DATE	COLIFORM BACTERIA PER 100 ML	5-DAY BOD	S O L I D S			N I T R O G E N A S N			ANIONIC	PHENOLS	IRON	
					TOTAL	SUSP	DISS	FREE	TOTAL	NITRITE	NITRATE	AS	IN	AS
								AMMONIA	KJELDAHL			ABS		
R-60.40														
D	DISCHARGE TO RIDEAU RIVER	*JUNE 30/67	--	760	1,234	134	1,100	--	13.0	---	---	--	--	--
	FROM MUNICIPAL WINTER	JULY 3/67	400	1,320	1,950	181	1,769	9.84	26.5	0.01	0.20	--	6	131.50
	SANITARY LANDFILL SITE AT	AUGUST 15/67	--	80	370	46	324	0.16	5.60	0.01	0.04	0.29	--	9.30
	CPR RAILWAY													
R-60.41	RIDEAU RIVER AT CARTHAGE	JUNE 13/67	200	1.7	152	2	150	0.39	--	0.00	0.75	0.0	--	--
	STREET	JUNE 19/67	588	2.1	114	<15	---	0.30	0.91	0.00	0.05	0.0	--	--
		JULY 5/67	900	1.2	138	1	137	0.10	0.52	---	0.08	0.0	--	--
		AUGUST 15/67	48	0.6	---	---	---	0.12	0.58	0.00	0.00	0.02	--	--
R-60.67	BROADVIEW AVENUE EAST													
W	STORM SEWER OUTFALL	JUNE 13/67	INSUFFICIENT FLOW FOR SAMPLING - OUTFALL PARTIALLY SUBMERGED											
R-60.67	BROADVIEW AVENUE EAST													
B-1	PUMPING STATION													
	BY-PASS SEWER	JUNE 13/67	OUTFALL NOT LOCATED											
R-60.67	LORNE STREET - COMBINED													
B-2	SEWER BY-PASS OUTFALL	JUNE 13/67	PERIODIC BY-PASSING - OUTFALL NOT LOCATED											
R-60.78	BEECH STREET - COMBINED	JUNE 13/67	NOT BY-PASSING - OUTFALL NOT LOCATED											
B	SEWER BY-PASS OUTFALL													

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SEPARATED TOWN OF SMITH'S FALLS

WATER POLLUTION

SURVEY

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UTILITIES COMMISSION

SAMPLE POINT NO.	DESCRIPTION	DATE	COLIFORM BACTERIA PER 100 ML	5-DAY BOD	S O L I D S			N I T R O G E N A S N				ANIONIC	PHENOLS IN PPB	IRON AS FE
					TOTAL	SUSP	DISS	FREE AMMONIA	TOTAL KJELDAHL	NITRITE	NITRATE	DETERGENTS AS ABS		
R-60.83 B	PINE STREET - COMBINED SEWER AT BY-PASS - OUTFALL	JUNE 13/67		NOT BY-PASSING - OUTFALL NOT LOCATED										
R-60.77 B	ELMSLEY STREET - COMBINED SEWER BY-PASS OUTFALL	JUNE 13/67		NOT BY-PASSING										
R-60.88 B	OAK STREET - COMBINED SEWER BY-PASS OUTFALL	JUNE 13/67		NOT BY-PASSING - OUTFALL NOT LOCATED										
R-60.95 W-B	RIVER STREET - OPPOSITE ELM STREET EAST-STORM SEWER & SANITARY SEWER BY-PASS (SAMPLED AT MANHOLE)	JUNE 13/67 JULY 5/67	150,000 7,400	190 0.6	560 334	113 11	447 323	12.6 0.10	18.0 1.70	0.00 0.02	0.10 0.08	4.2 0.1	60 --	-- --
R-60.95 O	CREEK TO RIDEAU RIVER EAST OF BROCKVILLE STREET	JUNE 13/67	270	1.7	174	5	169	0.12	1.78	0.00	0.10	0.0	4	--
R-60.96 W	LOMBARD STREET - STORM SEWER OUTFALL TO CREEK - OPPOSITE BROCKVILLE STREET	JUNE 13/67	380	1.5	196	5	191	0.10	1.04	0.00	0.10	0.0	2	--
R-61.00 W	BECKWITH STREET - STORM SEWER TO RIDEAU RIVER ON EAST SIDE OF BRIDGE	JUNE 13/67	45,000,000	108	348	62	286	24.6	28.0	0.60	0.05	1.6	20	--

UNLESS OTHERWISE INDICATED ALL RESULTS ARE RECORDED IN PPM

SEPARATED TOWN OF SMITH'S FALLS

WATER POLLUTION

SURVEY

*SAMPLED BY LEEDS & GRENVILLE HEALTH UNIT

**SAMPLED BY SMITH'S FALLS PUBLIC
UTILITIES COMMISSION

SAMPLE POINT NO.	DESCRIPTION	DATE	COLIFORM BACTERIA PER 100 ML	5-DAY BOD	S O L I D S			N I T R O G E N AS N				ANIONIC DETERGENTS	PHENOLS	IRON
					TOTAL	SUSP	DISS	FREE AMMONIA	TOTAL KJELDAHL	NITRITE	NITRATE	AS ABS	IN PPB	AS FE
R-61.00	RIDEAU RIVER AT BECKWITH STREET BRIDGE	JUNE 13/67	404	0.9	128	5	123	0.13	0.84	0.00	1.50	0.0	--	--
		JULY 5/67	700	1.2	6,794	2	6,792	0.12	0.71	--	0.08	0.00	--	--
		AUGUST 15/67	124	0.7	86	7	79	0.13	0.64	0.00	0.00	0.00	--	--
R-61.04 B:	MAPLE AVENUE - COMBINED SEWER BY-PASS OUTFALL	JUNE 14/67	BY-PASS WEIR AND SEWER OUTFALL NOT LOCATED											
R-61.04 W	OLD-MILL RACE TO RIDEAU RIVER ADJACENT TO MUNICIPAL WATER WORKS	JUNE 14/67	210,000	0.8	92	6	86	0.28	1.04	0.00	0.15	--	--	--
		JULY 5/67	11,600	1.3	162	2	160	0.13	8.3	0.08	0.12	0.0	--	--
R-61.10	RIDEAU RIVER AT CONFEDERATION DRIVE BRIDGE	JUNE 13/67	44	1.5	136	4	132	0.46	0.98	0.00	2.30	0.0	--	--
		JUNE 14/67	76	1.2	160	8	852	0.30	0.91	0.00	0.05	0.0	--	--

UNLESS OTHERWISE INDICATED ALL RESULTS ARE RECORDED IN PPM

APPENDIX

IMPLEMENTATION OF WATER AND SEWAGE WORKS PROGRAMS

Currently, there are three general methods which may be utilized for implementing sewage and water works programs. These are: 1) to enter into an agreement with the OWRC for the construction of the treatment and collector works with an obligation to pay the debt retirement and operating charges over the term of the agreement with the facility reverting to the municipality at the end of the term of the agreement, 2) by requesting the provision of service from a Provincially-owned project, and 3) by proceeding with the construction independently and meeting capital costs by the sale of debentures.

OWRC/MUNICIPAL PROJECTS

For the construction of water and sewage works under agreement with this Commission, the works are provided and developed under Sections 39 to 46 of the Ontario Water Resources Commission Act.

For this type of arrangement, the Commission utilizes a sinking fund and consequently the annual payments are based on a specific debt retirement period and the payments are unchanged for the period of the agreement. This type of project may be financed over a period of time up to a maximum of thirty years. The annual charges for projects constructed under this agreement are determined as follows:

1. Capital Repayment

As noted, OWRC financing is by the sinking fund method and an annual payment of approximately 2 per cent of the capital

cost is required to retire a debt over a thirty-year period.

2. Interest

On new Commission projects, interest is calculated at the current rate.

3. Reserve Fund

To provide money for repairs and replacements, Section 40 of The Ontario Water Resources Commission Act provides for the establishment of a reserve fund by the Commission. It is important to note that this fund is established in the name of the municipality and the balance consequently earns interest. It has now been established by Commission minute that the reserve fund billing for each project shall continue only until the fund reaches an amount of ten times the initial annual billing and the reserve fund billing shall be re-imposed only when the fund has been depleted to 80 per cent or less of the maximum amount.

4. Operating Costs

Under OWRC agreement, the municipality is responsible only for the operating costs directly attributed to the project in the municipality. Therefore, no charges are made by the Commission for the services of head office personnel who are available as required to advise on the satisfactory operation and maintenance of the project.

PROVINCIALY-OWNED WORKS

In June, 1967, the Honourable J. R. Simonett, Minister of Energy and Resources Management, made an announcement which expanded the authorization of this Commission for the provision of water supply and sewage treatment facilities. This new program allows the Commission to construct entire water and sewage works facilities for small municipalities. The capital costs of these can be amortized over a 40 year period.


A slight variation of this program could be implemented in that the municipality may request that this Commission provide only the major water and sewage works facilities as Provincially-owned works, and develop the water distribution and sewage collector systems under the standard type of Commission project. It would appear that where applicable, it would be more advantageous for the municipality to proceed on the basis of requesting this Commission to develop entire systems as Provincially-owned works.

The associated cost of supplying these works, including amortization of capital costs, together with operating and maintenance charges, will be recovered by the sale of service to the affected municipalities by rates determined on a usage basis. These facilities will be wholly-owned by the Province of Ontario and the arrangements for service will be formalized by contracts between the Commission and the municipality concerned. The installations will be operated entirely at cost with appropriate provision for adjustment in rate.

DEVELOPMENT

If a municipality, after considering the alternatives, wishes this Commission to consider Provincially-financed projects, application forms should be completed and submitted together with a resolution of the Municipal council. A draft of the suggested wording of the resolution is included with the application forms.

If the proposed works are to be built by the municipality on its own initiative or as a formal project under agreement with this Commission, it is required that the Council retain a consulting engineer to prepare preliminary engineering reports on the proposed work. If a Provincial system is contemplated, no action should be taken with respect to retaining a consulting engineering firm as the Commission will designate a consulting engineer to carry out the Provincial portion of the work and it would be advantageous if the municipal portion be studied and reported on by the same engineer.



APPENDIX I

SIGNIFICANCE OF LABORATORY ANALYSES

Bacteriological Examination

The presence of coliforms indicates pollution from human or animal excrement, or from some non-faecal forms. The objectives for surface water quality in Ontario is a maximum of 2400 organisms per 100 millilitres.

The OWRC Laboratories employ the Membrane Filter (MF) technique of examination to obtain a direct enumeration of coliform organisms. The Department of Health Laboratories use the Most Probable Member (MPN) enumeration and coliform counts are reported as Total Coliform Organisms (TC) and Faecal Coliform Organisms (FC).

Sanitary Chemical Analyses

Biochemical Oxygen Demand (BOD)

Biochemical Oxygen Demand is reported in parts per million (PPM) and is an indicated of the amount of oxygen required for the stabilization of decomposable organic or chemical matter in water. The completion of the laboratory test required five days, under the controlled incubation temperature of 20° Centigrade.

The OWRC objective for surface water quality is an upper limit of four (4) ppm.

Solids

The value for solids, expressed in parts per million, is the sum of the values for the suspended and the dissolved matter in the water. The concentration of suspended solids is generally

the most significant of the solids analyses with regard to surface water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, decomposition in streams and injury to the habitat of fish.

Nitrogen

Ammonia Nitrogen or sometimes called free ammonia is the insoluble product in the decomposition of nitrogenous organic matter. It is also formed when nitrates and nitrites are reduced to ammonia either biologically or chemically. Some small amounts of ammonia, too, may be swept out of the atmosphere by rain water.

The following values may be of general significance in appraising free ammonia content: Low 0.015 to 0.03 ppm; moderate 0.03 to 0.10 ppm; high 0.10 or greater.

Total Kjeldahl is a measure of the total nitrogenous matter present except that measured as nitrite and nitrate nitrogens. The Total Kjeldahl less the Ammonia Nitrogen measures the organic nitrogen present. Ammonia and organic nitrogen determinations are important in determining the availability of nitrogen for biological utilization. The normal range for Total Kjeldahl would be 0.1 to 0.5 ppm.

Nitrite Nitrogen

Nitrite is usually an intermediate oxidation of ammonia. The significance of nitrites, therefore, varies with their amount, sources, and relation to other constituents of the

sample, notably the relative magnitude of ammonia and nitrite present. Since nitrite is rapidly and easily converted to nitrate, its presence in concentrations greater than a few thousandths of a part per million is generally indicative of active biological processes in the water.

Nitrate Nitrogen

Nitrate is the end product of aerobic decomposition of nitrogenous matter, and its presence carries this significance. Nitrate concentration is of particular interest in relation to the other forms of nitrogen that may be present in the sample. Nitrates occur in the crust of the earth in many places and are a source of its fertility.

The following ranges in concentration may be used as a guide: low less than 0.1 ppm; moderate 0.1 to 1.0 ppm; high greater than 1.0 ppm.

Anionic Detergents as ABS

The presence of anionic detergents as ABS is an indication that domestic waste is present.

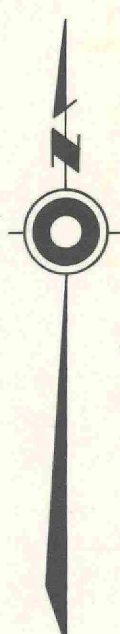
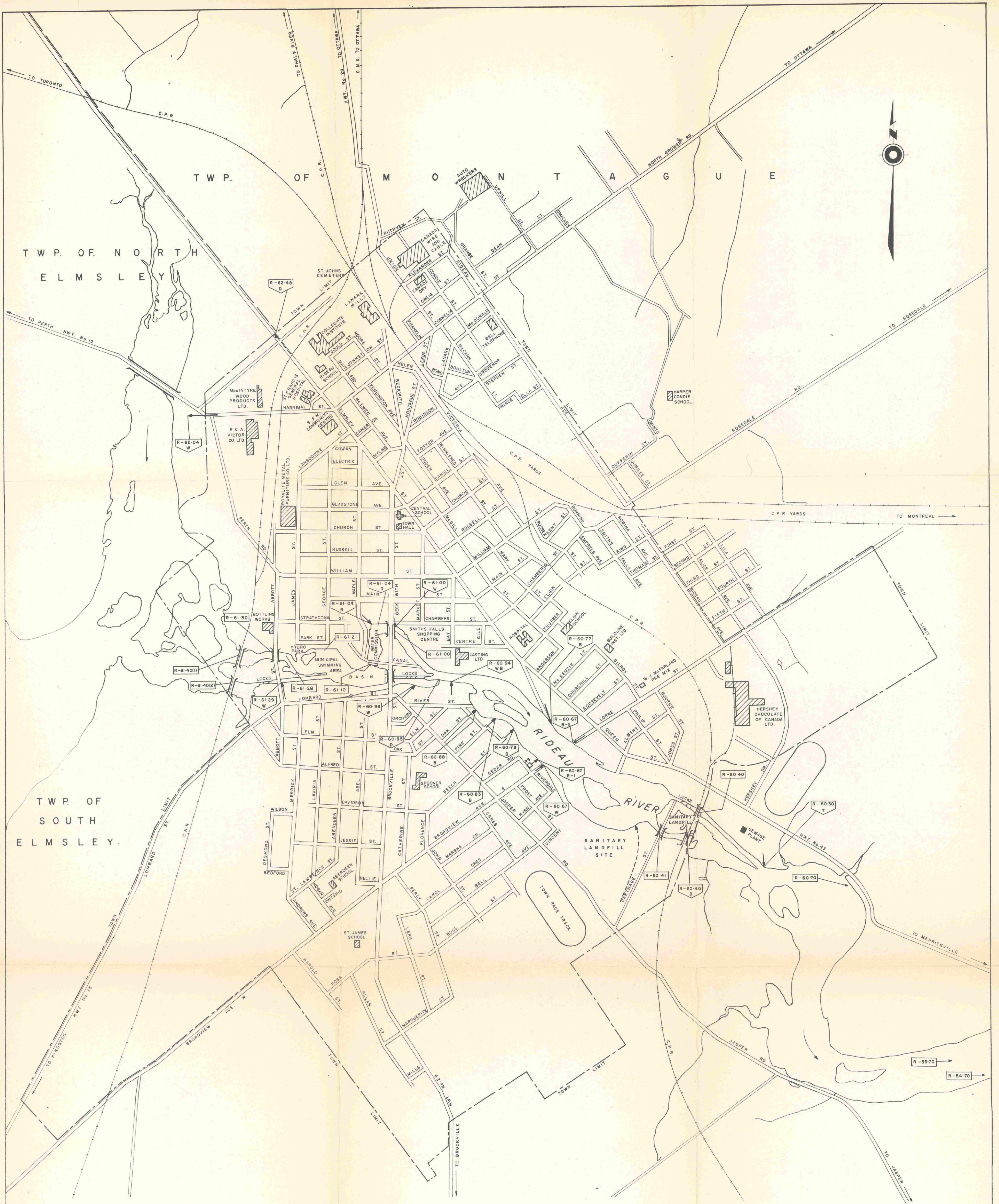
Phenols

The presence of phenol or phenolic equivalents is generally associated with discharges containing petroleum products, or with wastes from some industries. It is generally conceded that adequate protection of surface waters will be provided if the concentration of phenols in waste discharges does not exceed

20 parts per billion (ppb). Phenolic type waste can cause objectionable conditions in water supplies and might taint the flesh of fish.

Iron

Water for domestic use should contain less than 0.3 parts per million of iron in order to avoid objectionable tastes, staining and sediment formation. Iron concentrations of not greater than 17 parts per million in waste discharges should permit adequate protection of surface waters.



LEGEND

- R-61-30 - STREAM SAMPLING POINT SHOWING MILEAGE
- R-60-88 - OUTFALL SHOWING STREAM AND MILEAGE
- B - BYPASS SEWER
- D - DRAINAGE OR DITCH
- T - TREATMENT PLANT EFFLUENT
- W - STORM SEWER
- P.S. - PUMPING STATION

ONTARIO WATER RESOURCES COMMISSION

TOWN OF SMITHS FALLS
WATER POLLUTION SURVEY
1968

SCALE: 600 300 0 600 FEET

DRAWN BY: L. L. BROOME DATE: MARCH, 1968

CHECKED BY: A. D. M. DRAWING No: 68-18